

IN THE CLAIMS:

Please amend Claims 1, 21, 41, and 42 as follows.

1. (Currently Amended) An image processing apparatus which embeds predetermined information in an image and outputs the image to a printer which outputs the image as a print, the apparatus comprising:

input means for entering the image;

division means for dividing the entered image into plural image areas;

~~quantization~~ pseudo gradation process means for quantizing the image areas divided by said division means, utilizing error diffusion method; and

control means for controlling, in a unit of the image area, a quantization condition by said ~~quantization~~ pseudo gradation process means according to the predetermined information, and for causing in a unit of the image area, to generate a pattern in which a dot arrangement is different according to the predetermined information on the image output as the print.

2. (Original) An image processing apparatus according to Claim 1, wherein said quantization condition is a quantization threshold value.

3. (Original) An image processing apparatus according to Claim 2, wherein said quantization condition changes the quantization threshold value based on a predetermined period.

4. (Original) An image processing apparatus according to Claim 3, wherein said control means switches the predetermined period for changing the quantization threshold value in the unit of said image area.

5. (Previously Presented) An image processing apparatus according to Claim 4, wherein said control means switches the period in a horizontal direction and the period in a vertical direction for changing the quantization threshold value in the unit of the image area.

6. (Original) An image processing apparatus according to Claim 3, wherein said control means has plural kinds of the predetermined periods and switches the predetermined period in the unit of the image area.

7. (Original) An image processing apparatus according to Claim 1, wherein said predetermined information is audio information.

8. (Previously Presented) An image processing apparatus according to Claim 1, wherein said predetermined information is information relating to a copyright of the image.

9. (Previously Presented) An image processing apparatus according to Claim 1, wherein said predetermined information is added to the image in such a manner not easily visible to a human eye.

10. (Previously Presented) An image processing apparatus according to Claim 1, wherein said apparatus extracts the predetermined information from the image in which the predetermined information has been embedded, the apparatus further comprising:

input means for entering the image by scanning the print;

transformation means for executing frequency transformation on the image areas divided by said division means;

classification means for classifying the image areas into plural classes based on the transformation process of said transformation means; and

extraction means for extracting the predetermined information, based on a feature amount of each class thus classified.

11. (Original) An image processing apparatus according to Claim 10, wherein said frequency transformation is an orthogonal transformation.

12. (Original) An image processing apparatus according to Claim 10, further comprising comparison means for comparing the feature amount of the classified classes;

wherein said extraction means extracts said predetermined information based on the result of comparison by said comparison means.

13. (Original) An image processing apparatus according to Claim 10, further comprising: evaluation means for evaluating a result of evaluation; and

re-division means for executing again the division process of said division means, based on the result of evaluation by said evaluation means.

14. (Original) An image processing apparatus according to Claim 13, wherein said re-division means executes division again by changing the dividing position of the division.

15. (Original) An image processing apparatus according to Claim 13, wherein said re-division means executes division again by changing a size of division.

16. (Previously Presented) An image processing apparatus according to Claim 10, wherein said feature amount is an absolute value of coefficients of transformation by said transformation means.

17. (Original) An image processing apparatus according to Claim 10, wherein said feature amount is electric power.

18. (Original) An image processing apparatus according to Claim 10, wherein said predetermined information is audio information.

19. (Original) An image processing apparatus according to Claim 10, wherein said predetermined information is information relating to copyright of the image.

20. (Original) An image processing apparatus according to Claim 10, wherein said predetermined information is added to the image in such a manner not easily visible to human eyes.

21. (Currently Amended) An image processing method capable of embedding predetermined information in an image and outputting the image to a printer which outputs the image as a print, the method comprising:

an input step of entering the image;

a division step of dividing the entered image into plural image areas;

a ~~quantization~~ pseudo gradation process step of quantizing the image areas divided by said division means, utilizing error diffusion method; and

a control step of controlling, in a unit of the image area, a quantization condition by said ~~quantization~~ pseudo gradation process step according to the predetermined information, and for causing, in a unit of the area, to generate a pattern in which a dot arrangement is different according to the predetermined information on the image output as the print.

22. (Original) An image processing method according to Claim 21, wherein said quantization condition is a quantization threshold value.

23. (Original) An image processing method according to Claim 22, wherein said quantization condition changes the quantization threshold value based on a predetermined period.

24. (Original) An image processing method according to Claim 23, wherein said control step switches the predetermined period for changing the quantization threshold value in a unit of the image area.

25. (Previously Presented) An image processing method according to Claim 24, wherein said control step switches the period in a horizontal direction and the period in ~~the~~ a vertical direction for changing the quantization threshold value in the unit of the image area.

26. (Original) An image processing method according to Claim 23, wherein said control step has plural kinds of the predetermined periods and switches the predetermined period in the unit of said image area.

27. (Original) An image processing method according to Claim 21, wherein said predetermined information is audio information.

28. (Previously Presented) An image processing method according to Claim 21, wherein said predetermined information is information relating to a copyright of the image.

29. (Original) An image processing method according to Claim 21, wherein said predetermined information is added to the image in such a manner not easily visible to human eyes.

30. (Previously Presented) An image processing method according to Claim 21, wherein the method is capable of extracting the predetermined information from the image in which the predetermined information has been embedded, the method further comprising:

an input step of entering the image by scanning the print;

a division step of dividing the entered image into plural image areas;

a transformation step of executing frequency transformation on the image areas divided by said division step;

a classification step of classifying the image areas into plural classes based on the transformation process of said information step; and

an extraction step of extracting the predetermined information, based on a feature amount of each class thus classified.

31. (Original) An image processing method according to claim 30, wherein said frequency transformation is an orthogonal transformation.

32. (Original) An image processing method according to claim 30, further comprising a comparison step of comparing the feature amount of said classified classes;

wherein said extraction step extracts the predetermined information based on a result of comparison by said comparison step.

33. (Original) An image processing method according to claim 30, further comprising:

an evaluation step of evaluating a result of evaluation; and

a re-division means for executing again the division process of said division step, based on the result of evaluation by said evaluation step.

34. (Original) An image processing method according to claim 33, wherein said re-division step executes division again by changing the dividing position of the division.

35. (Original) An image processing method according to claim 33, wherein said re-division step executes division again by changing the size of division.

36. (Previously Presented) An image processing method according to claim 30, wherein said feature amount is an absolute value of the coefficients of transformation by said transformation step.

37. (Original) An image processing method according to claim 30, wherein said feature amount is electric power.

38. (Original) An image processing method according to claim 30, wherein said predetermined information is audio information.

39. (Original) An image processing method according to claim 30, wherein said predetermined information is information relating to copyright of the image.



40. (Original) An image processing method according to claim 30, wherein said predetermined information is added to the image in such a manner not easily visible to human eyes.

41. (Currently Amended) A computer readable memory medium which stores program codes for embedding predetermined information in an image and for outputting the image to a printer which outputs the image as a print, the program codes comprising:

a code for entering the image;

a code for dividing the entered image into plural image areas;

a code for a pseudo gradation process of quantizing the image areas divided by said ~~division means~~ dividing, utilizing error diffusion method; and

a code for controlling, in the unit of the image area, a quantization condition by said ~~quantization means~~ pseudo gradation process according to the predetermined information, and for causing in a unit of the image area, to generate a pattern in which a dot arrangement is different according to the predetermined information on the image output as the print.

42. (Currently Amended) A computer readable memory medium according to Claim [[1]] 41, wherein said medium stores program codes for extracting the predetermined information from an image in which the predetermined information has been embedded, the program codes further comprising:

a code for entering said image by scanning the print;

a code for executing frequency transformation on the image areas divided by said division means;

a code for classifying said image areas into plural classes based on the transformation process of said transformation means; and

a code for extracting said predetermined information, based on a feature amount of each class thus classified.

43. (Withdrawn) An image processing apparatus which adds predetermined information to an image, comprising:

input means for entering the image;

division means for dividing the entered image into plural image areas;

quantization means for quantizing the image areas divided by said division means, utilizing an error diffusion method; and

power generation means for generating power of a predetermined frequency component in unit of the image area according to the predetermined information,

wherein the predetermined frequency component is a frequency component lower than a maximum frequency component generated by said quantization means.

44. (Withdrawn) An image processing method for adding predetermined information to an image, comprising:

an input step of entering the image;

a division step of dividing the entered image into plural image areas;

a quantization step of quantizing the image areas divided in said division step, utilizing an error diffusion method; and

a power generation step for generating power of a predetermined frequency component in unit of the image area according to the predetermined information,

wherein the predetermined frequency component is a frequency component lower than a maximum frequency component generated in said quantization step.